Remarks

The Office Action mailed May 10, 2004, and the Notice of Non-compliant Amendment received September 8, 2004, have been carefully reviewed and the foregoing is made in consequence thereof.

In accordance with 37 C.F.R. 1.136(a), a one month extension of time is submitted herewith to extend the due date of the response to the Notice of Non-Compliant Amendment dated September 8, 2004 for the above-identified patent application from October 8, 2004, through and including November 8, 2004. In accordance with 37 C.F.R. 1.17(a)(1), authorization to charge a deposit account in the amount of $110.00 to cover this extension of time request also is submitted herewith.

Claims 11-23 are pending in this application. Claims 12 stands rejected. Claims 13-20 stand objected to. Claims 11 and 21-23 are withdrawn from consideration.

Reconsideration of the restriction requirement imposed under 35 U.S.C. § 121 is respectfully requested.

A restriction to either invention I, consisting of claims 12-20 drawn to a radar signal processing circuit, classified in Class 342, subclass 194, or invention II, consisting of claims 11 and 21-23, drawn to a filter calculating center frequency and bandwidth, classified in class 342, subclass other than 194, was imposed. In response, Applicants confirm the election with traverse to prosecute the invention of Group I, claims 12-20.

The requirement for election is traversed because the inventions set out by the claims in Groups I and II are clearly related. Applicants submit that a thorough search and examination of either Group would be relevant to the examination of the other Group and would not be a serious burden on the Examiner. Additionally, requirements for election are not mandatory under 35 U.S.C. 121. Accordingly, reconsideration of the election requirement is requested.

The rejection of Claim 12 under the judicially create doctrine of obviousness-type double patenting as being unpatentable over Claim 21 of U.S. Patent No. 6,674,397 is respectfully traversed.

Claim 12 recites a radar signal processing circuit comprising "a correlation band pass filter configured to filter non-zero gated radar return samples and not process a portion of zero amplitude gated radar return samples," "a band pass filter centered on the doppler frequency" and "a processor configured to determine a center frequency for said band pass filter, said processor configured to receive velocity vectors in body coordinates, an antenna mounting angle, and a slant range."

Claim 21 of U.S. Patent No. 6,674,397 does not describe or suggest a radar signal processing circuit having a processor configured to receive velocity vectors in body coordinates, an antenna mounting angle, and a slant range for determining a center frequency of a band pass filter.

For the reasons set forth above, Applicants respectfully request that the obviousness-type double patenting rejection of Claim 12 be withdrawn.

The rejection of Claim 12 under 35 U.S.C. § 103 as being unpatentable over Hager et al. ('776) in view of Hager et al. (U. S. Patent No. 6, 025,800) and Wicks et al. (U. S. Patent No. 5,499,030) is respectfully traversed.

Hager et al. ('776) describe a radar altimeter 8 which includes three channels, each including an antenna 10, a receiver 34, and a digitizer 18. Radar altimeter 8 further includes RF oscillator 20, clock generator 26, transmitter 32, digital signal processor (DSP) 30 and computer 33. DSP 30 includes range gate/correlators 36A-36D, word integration band pass filters (BPFs) 38A-38D, image reject mixers 40A-40D, doppler band pass filters (BPFs) 42A-42D, range processor 44, coarse phase processor 46A, coordinate location processor 46B and fine phase processor 46C. Coarse phase processor 46A, coordinate location processor 46B and fine phase

processor 46C are collectively referred to as phase processor 46. Radar altimeter 8 provides cross-track and vertical distance to the highest object below the air vehicle in, for example, ten foot wide down-track swaths, which are bounded by an antenna pattern that is approximately 46 degrees wide in the cross-track direction. (Column 2, line 47 to Column 3, line 8 and Column 4, lines 8-16).

Hager et al. ('800) describes an interferometric radar altimeter utilizing a Doppler filter and a range gate. At Column 5, lines 1-15, Hager et al. describe an I/Q mixer which converts samples of a radar return to a baseband frequency and provides in-phase and quadrature phase outputs to a digitizer for positive and negative Doppler frequency determination. Once the return from the I/Q mixer 46 is digitized by a digitizer 46, the Doppler filter 94 of the processor 48 is set to pass only the desired Doppler swath as determined from the vertical velocity provided by the vehicle's internal navigation system.

Wicks et al. describe a constant false alarm rate (CFAR) signal processor which improves radar signal processor performance by increasing target probability of detection and reducing probability of false alarms in a severe radar clutter environment. Column 1, lines 12-16. Further, referring to Column 5, lines 39-55, radar signal processing techniques are described. Specifically, that interference is suppressed by the use of canceller-based filters such as a Moving Target Indicator (MTI), assuming pulse to pulse invariance of the ground clutter. Further, Doppler processing is described which further suppresses clutter returns and improves Signal to Noise Ratios (SNR). Also, the output of the zero Doppler filter is ignored. However, ignoring an output of a zero Doppler filter is not equivalent to filtering non-zero radar return samples and not processing (filtering) a portion of zero amplitude radar return samples.

Claim 12 recites a radar signal processing circuit that comprises "a radar gate correlation circuit configured to sample radar data at a sampling rate," "a correlation band pass filter configured to filter non-zero gated radar return samples and not process a portion of zero amplitude gated radar return samples," a mixer configured to down sample an in-phase

component and a quadrature component of the filtered signal to a doppler frequency," "a band pass filter centered on the doppler frequency" and "a processor configured to determine a center frequency for said band pass filter, said processor configured to receive velocity vectors in body coordinates, an antenna mounting angle, and a slant range."

Hager et al. ('776) in view of Hager et al. ('800) and Wicks et al. do not describe nor suggest a radar signal processing circuit where a filter is configured to filter non-zero radar return samples and not process a portion of zero amplitude radar return samples. In addition, Hager et al. ('776) in view of Hager et al. ('800) and Wicks et al. do not describe nor suggest a radar signal processing circuit where a processor is configured to determine a center frequency for a band pass filter where zero amplitude radar return samples are not processed by a correlation band pass filter and therefore not applied to the band pass filter.

For the reasons set forth above, Claim 12 is submitted to be patentable over Hager et al. ('776) in view of Hager et al. ('800) and Wicks et al. and Applicants respectfully request that the Section 103 rejection of Claim 12 be withdrawn.

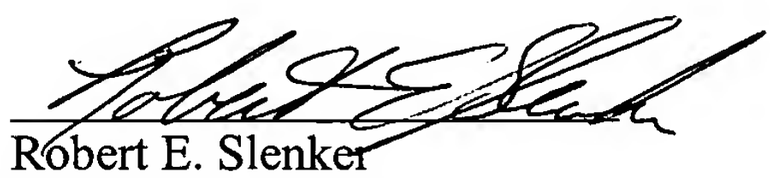
In addition, Applicants respectfully submit that the Section 103 rejection of presently pending Claim 12 is not a proper rejection. Obviousness cannot be established by merely suggesting that it would have been obvious to one of ordinary skill in the art to modify Hager et al. ('776) in view of Hager et al. ('800) and Wicks et al. to produce the claimed invention. Rather, each alleged obvious matter of design choice must always be supported by citation to some reference work recognized as standard in the pertinent art, and the Applicants given an opportunity to challenge the correctness of the assertion or the repute of the cited reference. Applicants have not been provided with the citation to any reference supporting the combination made in the rejection. Neither Hager et al. ('776), nor Hager et al. ('800), nor Wicks et al. considered alone or in combination, describe or suggest the claimed combination. Rather, the present Section 103 rejection is based on a combination of teachings selected from multiple patents in an attempt to arrive at the claimed invention. Accordingly, Applicants respectfully

submit that there is no suggestion or motivation to combine Hager et al. ('776), Hager et al. ('800), and Wicks et al.. Since there is no teaching nor suggestion in the cited art for the claimed combination, the Section 103 rejection appears to be based on a hindsight reconstruction in which isolated disclosures have been picked and chosen, using the claimed invention as an instruction manual or "template", to piece together the teachings of the cited art in an attempt to deprecate the present invention which is impermissible. Applicants respectfully submit that the § 103(a) rejection of Claim 12, at least to the extent that it relies on Hager et al. ('776) in view of Hager et al. ('800) and Wicks et al., is improper and should be withdrawn. For these reasons, in addition to the reasons given above, Applicants request that the Section 103 rejection of Claim 12 be withdrawn.

The objection to Claims 13-20 is respectfully traversed. Claims 13-20 depend from independent Claim 12 which is herein submitted to be patentable. For the reasons set forth above, Applicants request that the objection to Claims 13-20 be withdrawn.

In view of the foregoing amendments and remarks, all the claims now active in this application are believed to be in condition for allowance. Reconsideration and favorable action is respectfully solicited.

Respectfully Submitted,



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